

THE IMPACT THAT DEFENSE REFORM HAD ON PROCUREMENT OF MAJOR
WEAPONS SYSTEMS: A CASE STUDY OF THE V-22 AND THE EFFECT
OF THE GOLDWATER-NICHOLS ACT ON ITS PROCUREMENT

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Military History

by

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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

THE IMPACT THAT DEFENSE REFORM HAD ON PROCUREMENT OF MAJOR WEAPONS SYSTEMS: A CASE STUDY OF THE V-22 AND THE EFFECT OF THE GOLDWATER-NICHOLS ACT ON ITS PROCUREMENT, by LCDR Michael G. King, 85 pages.

The effect that defense reform has had on the procurement of major weapon systems is a topic that will often be debated as the Department of Defense and the military services transform to meet the needs for the uncertainties of the 21st century and beyond. For this reason, a study of the evolution of defense budgeting and acquisition and the significant pieces of legislation that shaped the way we acquire major weapon systems provides insight into our current structure and effectiveness of federal budgeting and acquisition process. Presented in this thesis are the effects that the Goldwater-Nichols Department of Defense Reorganization Act of 1986 (GNA) had on the procurement of the V-22. This study provides a detailed look at factors that led up to the enactment of GNA. It will also examine acquisition shortcomings that led to the passing of the legislation and budget shortfalls in the 1980s that carried over to the early 1990s. This thesis, in particular, studies the early days of the Vertical Takeoff and Landing (VTOL) technology and the research and development advancements up to the development of the V-22. It also assesses the characteristics of the V-22 design and its ability to influence combat technology. This thesis assesses the impact and implications that the legislation had on the V-22 as a major weapons system. The thesis concludes that recommendations of the GNA were not adopted and, therefore, not properly implemented and that the GNA had little to no effect on acquisition and production of the V-22.

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TABLE OF CONTENTS

	Page
MASTER OF MILITARY ART AND SCIENCE THESIS APPROVAL PAGE	iii
ABSTRACT	iv
ACKNOWLEDGMENTS	v
TABLE OF CONTENTS	vi
ACRONYMS	viii
ILLUSTRATIONS	ix
CHAPTER 1 INTRODUCTION	1
Background	1
Primary Research Question	4
Secondary Research Questions	4
Significance	5
Assumptions	5
Limitations	6
Delimitations	6
CHAPTER 2 LITERATURE REVIEW AND METHODOLOGY	7
Literature Review	7
Research Methodology	14
CHAPTER 3 ANALYSIS OF DEFENSE REFORM	16
Origins of Defense Budgeting and Acquisition Reform	16
The Road to GNA	17
1960s Reform	20
1970s Reform	22
The GNA	28
The V-22 and Acquisition Reform	36
CHAPTER 4 HISTORY OF THE V-22 OSPREY	38
Introduction	38
Early Beginnings	39
Military Operational Deficiencies	41

The Evolution of the V-22 Osprey	42
CHAPTER 5 CONCLUSION AND RECOMENDATIONS.....	53
Final Thoughts	57
Recommendations for Further Research.....	59
APPENDIX A RECOMMENDATIONS AND LEGISLATION	62
APPENDIX B AIRCRAFT	66
BIBLIOGRAPHY	74

ACRONYMS

DoD	Department of Defense
GAO	Government Accounting Office
GNA	Goldwater-Nichols Act
IOC	Initial Operational Capability
OSD	Office of the Secretary of Defense
PPBS	Planning, Programming, and Budgeting System
VTOL	Vertical Takeoff and Landing

ILLUSTRATIONS

	Page
Figure 1. Henry Berliner Tilt-Propeller Helicopter.....	66
Figure 2. McDonnell XV-1 Compound Helicopter.....	67
Figure 3. Platt LePage XR-1A Lateral Twin-Rotor Helicopter	67
Figure 4. Platt LePage Tilt Rotor Transport Aircraft Design.....	68
Figure 5. Illustration from the Haviland Platt Patent of the Tilt Rotor Concept.....	69
Figure 6. Bell Helicopter XV-3 Tilt Rotor Aircraft	70
Figure 7. Crash of the XV-3 on 25 October 1956	70
Figure 8. Initial Bell Tie Down Showing Metal Protective Shields.....	71
Figure 9. Top-Senator Goldwater in the XV-15 with Bell Pilot Dorman Cannon Borrom-Secretary of the Navy John Lehman after Flying the XV-15	72
Figure 10. The Bell Boeing V-22 Osprey in Hover Flight.....	73
Figure 11. Mockup of the BA-Model 609 Civil Tilt Rotor Aircraft with Bell Boeing Markings	73

CHAPTER 1

INTRODUCTION

Defense acquisition reform has been a persistent problem throughout our nation's history. The first set of defense acquisition regulations were established by the Armed Services Procurement Act and The National Security Act of 1947 following the Second World War. To understand the evolution of defense budgeting and acquisition reform we must understand why acquisition reform is so important and look back at what significant pieces of legislation over the past century have provided the structure for our current federal budgeting and acquisition process.

The primary question this thesis will answer is what, if any, effect did the Goldwater-Nichols Department of Defense Reorganization Act of 1986 (GNA) have on the procurement of the V-22? The Navy and Army are considering buying the V-22 as part of a perceived need to fill gaps in certain mission areas and to replace existing legacy airframes. The United States (U.S.) Department of Defense (DoD) has spent decades reforming the acquisition process for major weapons that possibly have little impact on shaping the battlefield for current and future operations. For this reason, a historical study of how major weapon systems have been contracted and procured over the past century warrants research. The V-22 program lends itself to this kind of analysis.

Background

In 1985 President Ronald Reagan established the Blue Ribbon Commission on Defense Management due to the loss of public confidence in the effectiveness of the defense acquisition system. The acquisition system was failing in large part due to

overpriced spare parts, test deficiencies, and cost and schedule overruns. This commission and other influences such as sky rocketing acquisition costs came together in the mid-1980s and exacerbated the acquisition situation dramatically. This in effect, made the passage of the Goldwater-Nichols legislation possible. The GNA was possibly the most comprehensive piece of legislation passed in the last 40 years.¹ The feeling throughout the military services was that reform was necessary. There had been growing concerns that some of the effects would put an even greater divide between the “military requirement process and a civilian run acquisition process.”² The GNA completely restructured the way the DoD and the military services acquired military weapons systems. The resulting pressure caused deep cuts in high dollar conventional weapons program, which lasted well into the 1990s.

One of these emerging programs, the V-22 Osprey began in 1981. Vertical Takeoff and Landing (VTOL) technology was not a new engineering concept. During the 1920s and 1930s, there were numerous innovative flying machines including several concepts that were expected to provide vertical takeoff and landing capabilities.³ VTOL technology being developed during this timeframe never took hold because of the growing demand to support the Second World War.

¹Charles Nemfakos, Irv Blickstein, Aine Seitz McCarthy and Jerry M. Sollinger, “The Perfect Storm: The Goldwater-Nichols Act and Its Effect on Navy Acquisition” (Occasional paper, RAND Corporation, Santa Monica, CA, 2010), iii.

²Ibid.

³Martin D. Maisel, Demo J. Giulianetti and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), 5.

The development in VTOL technology reemerged in the late 1940s and early 1950s. Early development of the aircraft fell under a joint venture with the U.S. Army and U.S. Air Force convertiplane program.⁴ By 1981, the DoD started what is now the V-22 program. At first the program fell under Army sponsorship, with the Navy/Marine Corps later taking the lead with full-scale development of the V-22 tilt rotor aircraft beginning in 1986. The program was envisioned to fill the gap between traditional short-range helicopters and the need for a long-range aircraft. The services called for an aircraft that could take off and land vertically, with a “continuous cruise speed of not less than 250 knots and, to meet worldwide self-deployment objectives, a minimum range capability of 2,100 nautical miles, unrefueled” and fill a multitude of other roles.⁵ During this time most production and development contracts were negotiated on a firm, fixed price basis. There were advantages and disadvantages to negotiating these types of contracts but the main advantage was to keep underbidding contractors from renegotiating contracts later to recover understated costs.⁶ This practice could prove high risk for both the government and a contractor developing aircraft with relatively new undeveloped technologies.

⁴Maisel et al., 4.

⁵General Accounting Office, GAO/NSAID-88-45S-7, *DoD Acquisition: Report to Congressional Requesters* (Washington, DC: U.S. General Accounting Office, 31 July 1987), 2.

⁶Danny R. Smith, “The Influence of Contract Type in Program Execution/V-22 Osprey: A Case Study” (Thesis, Naval Postgraduate School, Monterey, CA, December 1989), 18-19.

Primary Research Question

What effect did the GNA have on the procurement of the V-22? When considering the historical complexities of such a large bureaucratic system such as the U.S., problems are to be expected to occur in major weapon acquisitions, given the risks and difficulties involved. Such problems should not be accepted as the norm. Although improvements in the acquisition process have been made over the past four decades, the same kinds of problems tend to reappear when looking at today's acquisitions processes.

Secondary Research Questions

1. What effect did the GNA have on costs and production of the V-22?
2. How did the passage of the GNA affect the Joint Acquisition process?
4. What was the acquisitions process before and after the GNA?
5. What effect did the GNA have on future legislation and budgeting?
6. What impact and implications did the GNA have on the Marine Corps from 1986 to 2007?
7. What impact and implications did the GNA have on the other services?

The above questions will determine if defense reform was effective in the reduction of cost and improvement in joint capabilities for the V-22 program. These results might serve as a framework for larger conclusions about GNA and weapons procurement during the same time frame as that of the V-22 program lifecycle to initial operational capability (IOC).

Significance

Research substantiates that the GNA came at a time when change was needed. The transformation of a large bureaucratic organization would be hard to implement and difficult to change and change quickly. The resulting GNA passed focused on fixing a multitude of problems. Up until the GNA was enacted, there had not been a significant piece of DoD and military services legislation passed in decades. Historical evidence shows that during this timeframe the inefficient acquisition process was rampant with fraud, waste and abuse. Throughout this period there were investigations and commissions established to deal with the corruption among government and contractor interaction. A Blue Ribbon Commission on Defense Management (Packard Commission) was first formed 1986 in to deal with these issues. This study will also examine how the reforms and budget deficits may have affected weapons systems acquisition such as the V-22 and how that in turn affected costs, production, and may have led to unforeseen program challenges. This thesis will provide historical insight to future leaders and policy makers on how applying lessons learned from the past will contribute to future acquisitions of weapons systems.

Assumptions

This study assumes that the implementation of the GNA had quantifiable effects on the procurement of the V-22. Also the Act was the most significant change in legislation that the DoD had seen in decades. It was thought to solve not only the problem of the military services' ability to perform joint operations effectively; but also fixed a corrupt weapon acquisition system. This study finally assumes that the V-22 affected the separate service components' capacity to fill a perceived capabilities gap.

Limitations

This thesis will focus on a historical perspective based on legislation passed in the mid-1980s and 1990s. The study of the GNA will be limited to the effects it had on the procurement of the V-22. The intent is to find insight gained from defense reform and the resulting effects it has on the purchase of major weapon systems.

Delimitations

This thesis will not address current research of future procurement, concepts, development, operational, and future capabilities. Additionally, the author will not make any recommendations for a specific aircraft or perceived needs of capabilities for the future, but simply look at the impact on the V-22. The research did not utilize classified or for official use only documents.

CHAPTER 2

LITERATURE REVIEW AND METHODOLOGY

Literature Review

This study will analyze the acquisition shortfalls that led to comprehensive defense reforms in the 1980s. Up until the GNA was enacted, there had been no significant piece of DoD and military services legislation passed in decades. In the decades leading up to the passage of the GNA and during this timeframe the inefficient acquisition process was proven to be rampant with fraud, waste and abuse. The outcome of this inefficient acquisition process led to several investigations, which led to bribery and fraud convictions of government officials and defense contractors. Additionally, the inefficient acquisition process led to the establishment of the Packard Commission, which was the basis of the legislation that was passed.

The following chapter provides an historical background of defense reform. It is offered as a guide to explain the current system of acquisitions. The use of primary source documents will provide an understanding of the evolution of defense budgeting and acquisition process. The chapter moves on using primary source documents, reports, and studies that will analyze the GNA. The GNA was a widely accepted piece of legislation in large part to overcome shortcomings in the acquisition system and budget shortfalls in the 1980s that carried over to the early 1990s. Next, the chapter will discuss the reforms and budget deficits that affected acquiring weapons systems such as the V-22 and how that affected costs, production, and may have led to unforeseen program challenges.

There are numerous records, journal articles, case studies, books, and master's theses readily available to analyze the defense acquisition reforms that took place in the early to mid-1980s. Acquisition reform will be covered by a number of primary resources and peripherally in a number of secondary sources. The literature that covers the historical concepts of tilt rotor technology will be covered by numerous primary source documents, case studies, and master's theses. This literature however, leaves out the interrelationships between acquisition reform and analysis of how weapons systems are contracted.

Primary sources are Public Law 110–53 and the *National Security Act of 1947*, 26 July 1947.⁷ These sources will provide contextual support for defense reform. The final report to the President titled *President's Blue Ribbon Commission on Defense Management, A Quest for Excellence: Final Report to the President* chaired by David Packard will provide many of the recommendations of the Packard Commission, which was intended to assist the Executive and Legislative Branches as well as industry in implementing a broad range of needed improvements.⁸ Additionally Public Law 99-433 and *Goldwater-Nichols Department of Defense Reorganization Act of 1986*, October 1, 1986⁹ was put in to place to improve advice given to the president on many aspects, but for the concerns of this paper, it provides for more efficient use of defense resources in

⁷Public Law 110–53, *National Security Act of 1947*, 26 July 1947.

⁸David Packard, *President's Blue Ribbon Commission on Defense Management, A Quest for Excellence: Final Report to the President*, 30 June 1986, <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA170887> (accessed 14 June 2013).

⁹Public Law 99-433, *Goldwater-Nichols Department of Defense Reorganization Act of 1986*, 1 October 1986.

regards to weapons systems procurement. The Congressional Budget Office reports, Government Accounting Office (GAO) case studies, Office of the Inspector General, Army System Acquisition Policy and Procedures, Army Regulation 70-1, *Army Acquisition Policy*, Secretary of the Navy Instruction, and other DoD reports will provide significant insight into the policies and procedures for managing acquisition programs.

Secondary sources will provide mostly background information on acquisition shortcomings that led to the passing of the GNA. Other works will address the control of runaway acquisition costs, and the DoD insisting that the development and procurement of major weapons systems be based upon firm fixed-price contracts.

In his work, *Defense Acquisition Reform, 1960–2009 An Elusive Goal*, J. Ronald Fox of the U.S. Army Center of Military History, provides historical insight into the defense acquisition process for major weapons systems. He provides a systematic account of defense reform from 1960 to 2009. He identifies the long-term trends that our system encountered over the last four decades. He provides historical descriptions and analysis of how policy makers and acquisition managers overcame shortfalls and paved the road ahead.

The RAND Corporation study conducted by Charles Nemfakos, Irv Blickstein, Aine Seitz McCarthy and Jerry M. Sollinger titled “The Perfect Storm: The Goldwater-Nichols Act and Its Effect on Navy Acquisition,”¹⁰ provides contextual support on the implementation of the GNA. This study examines the influences and factors that made the passage of the legislation possible. The study gives an account of the divide between

¹⁰Nemfakos et al.

a “military-run requirements process ad a civilian-run acquisition process.”¹¹ It goes into detail about the investigations and commissions that occurred prior to GNA, which were the foundation of the legislation that was passed. It provides insight into large policy shifts that occurred in the defense re-organization of the 1980s and 1990s.

James R. Locher, III, in his article “Taking Stock of Goldwater-Nichols,” in *Joint Forces Quarterly*,¹² takes a look back 10 years after the GNA was signed into law. This article analyzes the results and expectations that were set forth. It emphasizes the lack of information that the services provided the Office of the Secretary of Defense (OSD) before GNA was implemented, which in turn lessened civilian control over the military. It is a comparative article on performance expectations and the law’s contribution to the defense establishment to see if objectives that were set forth in the GNA were successful. When looking at the article in regards to the resource allocation, Mr. Locher states “Implementation has not achieved the potential of the Goldwater-Nichols reforms with the exception of General Powell’s effective use of his resource advisory role in formulating the Base Force.”¹³ He provides detail into the Joint Requirements Oversight Council and explains if the process is exploited by the military it runs the possibility of returning to the inefficient, pre-GNA periods.

The literature is quite extensive on the development of tilt rotor technology. The documents provide a lot of information regarding specific data on research and the

¹¹Nemfakos et al., iii.

¹²James R. Locher, III, “Taking Stock of Goldwater-Nichols,” *Joint Forces Quarterly* (Autumn 1996).

¹³*Ibid.*, 38.

evolution tilt rotor aircraft. Historians, test pilots, and various military staff colleges write much of the literature. The history of the VTOL technology will be covered with a key source being Martin D. Maisel, Demo J. Giulianetti and Daniel C. Dugan “Monographs in Aerospace History #17: The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight.”¹⁴ This monograph paints a detailed description of the evolution of tilt rotor technology starting with the earliest designs of Leonardo da Vinci in the 15th century. It captures the progression of VTOL aircraft beginning with early attempts by McDonnell Douglas, Sikorski, and Bell Helicopter designs in the 1950s. It continues with testing, design, development and eventually awarding the contract for what was called the V-22 Osprey. The monograph presents a detailed year-by-year description of nearly every aspect of research and development until introduction of the first production aircraft into the Marine Corps in 1999.

The next piece of literature is the thesis written in December 1989 by Danny Roy Smith titled “The Influence of Contract Type in Program Execution/V-22 Osprey: A Case Study,”¹⁵ looks at the impacts that fixed priced contracts had on major weapon system programs. He uses the V-22 program as a case study on the influences these types of contracts had on the development phase of the program. His belief was based on historical data and the political environment of the time that the fixed priced type contract was the best for the government to use.

The National Defense University National War College essay written by Lieutenant Colonel Carl J. Fosnaugh entitled “How we Provide for the Common

¹⁴Maisel et al.

¹⁵Smith.

Defense: A Review of the Interactive Decision Making Process of the V-22 Osprey Program from 1981 through 1992”¹⁶ examines the development and acquisition of the V-22 through the perspective of the agencies, organizations, and individuals involved. It provides an illustration of how an influential Congress, contractors, lobbyists, and the Marine Corps got around the defense budget and the Secretary of Defense in the late 1980s.

The Marine Corps played an extremely important role and had a vested interest in the successful development and procurement of the V-22. The GNA would play an important role in redefining the framework within the DoD and how the Marine Corps fit into the organizational context of conducting joint military operations. There is no doubt that the GNA had quantifiable effects on the Marine Corps. “The Goldwater-Nichols Act of 1986: Impact and implications for the Marine Corps”¹⁷ written by Major Asad Khan, U.S. Marine Corps School of Advance Warfighting concludes a favorable outcome as the result of passing the GNA. He sites that as a result, the Chairman of the Joint Chiefs of Staff and service chiefs “successfully transformed the military into an organization capable of planning and conducting complex joint military operations.”¹⁸ The author gives a favorable outcome as to the impact the GNA had on the Marine Corps ability to acquire weapons systems. He expanded that by emphasizing the authority given to the

¹⁶Carl J. Fosnaugh, “How we Provide for the Common Defense: A Review of the Interactive Decision Making Process of the V-22 Osprey Program from 1981 through 1992” (Essay, National War College, Washington, DC, 2003).

¹⁷Major Asad Khan, “The Goldwater-Nichols Act of 1986: Impact and implications for the Marine Corps” (Thesis, United States Marine Corps School of Advanced Warfighting, Marine Corps University, Quantico, VA, 1998), ii

¹⁸*Ibid.*, iv.

Chairman of the Joint Chiefs of Staff; with the Joint Requirements Oversight Council having the most significant impact on Marine Corps acquisition.

The thesis written by Mark A. Obrien titled “The V-22 Osprey: A Case Analysis”¹⁹ examines the history of tilt rotor technology and program management. It delves into the relationships of Congressional actions and the interaction between the Marine Corps, OSD, and Congress. It analyzes the wide range of missions set forth by the services that the V-22 was expected to fill. Finally it examines the commercial and foreign military sales aspects of developing tilt rotor technology.

The final source is a thesis written by Colonel Harry Jensen, U.S. Marine Corps titled “To Clip an Osprey’s Wings.”²⁰ This thesis delivers insight on how decisions are made affecting our national security and gives direction on how decisions are influenced through organizations and individuals disproportionately within our bureaucracy. This study uses the V-22 as a basis of the bureaucratic process, which apportions resources to carry out the national security strategy. It examines the V-22 program as a lesson learned for the process of awarding defense contracts. It discusses issues of affordability vs. national defense needs. Finally, it discusses how then Secretary of Defense Cheney dropped the program from the 1989 budget but somehow allowed the research and development program to continue.

¹⁹Mark A. Obrien, “The V-22 Osprey: A Case Analysis” (Thesis, Naval Postgraduate School, Monterey, CA, 1992).

²⁰Harry Jensen, “To Clip an Osprey’s Wings” (Essay, National War College, Washington, DC, 20 December 1991).

Research Methodology

This thesis is a detailed study on defense reform and the impact reform had on the procurement of a major weapon system. This study will focus on the GNA. The GNA is one of the most extensively examined pieces of legislation that has ever been passed. For this reason both its implementation and impacts are relevant in identifying shortcomings in the acquisition process. This thesis will examine the V-22 Osprey as a case study to provide insight into the effect that this legislative reform had on the procurement of a major weapon system.

Research includes sources from the Combined Arms Research Library through the author's own research as well as the use of the library staff. The most relevant sources are from historical documentation of legislation and governmental reports published throughout the last century. The approach taken to implement the law and development of unproven technology are especially useful.

First, data is gathered and analyzed on the first set of defense acquisition regulations that were established by the Armed Services Procurement Act and The National Security Act of 1947 following the Second World War. Next, this study will provide an understanding of the evolution of defense budgeting and acquisition reform. The study will focus on legislation over the past century that has provided the background for our federal budgeting and acquisition processes. This study will compare how acquisitions and contracts of weapons systems were obtained immediately before and then after passage of the GNA. The research will provide a short history of tilt rotor aviation and explain how the technology progressed up until the original DoD contract for 1981. The focus of this research is on the effect that the GNA had on the continued

development of the V-22 up until IOC. Once data gathering is complete, the researcher will examine the possible impacts and implications the GNA had on procurement of the V-22 Osprey. Finally, the thesis will conclude on insights gained, and possible unintended effects on future legislation.

CHAPTER 3

ANALYSIS OF DEFENSE REFORM

Origins of Defense Budgeting and Acquisition Reform

To understand the evolution of defense budgeting and acquisition reform we must look back at the significant pieces of legislation over the past century that have provided the structure for our current federal budgeting and acquisition process. The organizational structure that was developed became a convoluted maze of bureaucracy that was decentralized and had very little oversight. This caused long-term problems for the DoD, which it has been trying to reconcile over the past six decades.

Substantial reforms have only happened a handful of times since our nation emerged as the pre-eminent superpower. The General Accounting Act of 1921, which, “required the President to issue an annual federal budget and established the Government Accountability Office (GAO) as an independent agency to investigate how federal dollars are spent.”²¹ The next significant pieces of legislation dealt with issues such as national security reform and establishing acquisition regulations. These pieces of legislation have presented considerable challenges over the past 60 years. The Armed Services Procurement Act and The National Security Act of 1947 following the Second World War, amended in 1949, 1953, and 1958, and the GNA. These landmark pieces of legislation paved the way for DoD reorganization and reforms to the acquisitions process.

²¹U.S. Government Accountability Office, “U.S. Government Accountability Office,” <http://www.gao.gov/> (accessed 19 June 2013).

The Road to GNA

Prior to the legislative reform of 1947 the military department's (the Department of War and the Department of the Navy), budgeting and procurement processes were independent of each other. There were attempts to unify the "procurement policies and procedures" during the First and Second World Wars, but the "authority remained decentralized in the Military Departments. By the end of the Second World War both the Legislative and Executive Branches saw the need to reorganize "defense production, distribution and supply, as well as research and development, in the Military Departments."²² The one consensus that was agreed upon was the need for expansion in technology development.

The Armed Services Procurement Act of 1947 was an attempt to reconcile the ambiguity in the way contracts were awarded prior to 1947. The act dealt with the manner contracts were awarded "but provided little guidance regarding contract administration."²³ The act also established the Federal Acquisition Regulation. The Federal Acquisition Regulation was the primary source of guidance in the way contracts were administered and "a substantial and complex set of rules governing the federal government's purchasing process."²⁴ In 1984 just prior to GNA the Federal Acquisition

²²U.S. Congress, Senate, Committee on Armed Services, *The Need for Change, Staff Report to the Committee on Armed Services, United States Senate*, 99th Cong., 1st sess., 1985, 530.

²³David Packard, "Appendix to Blue Ribbon Commission," *President's Blue Ribbon Commission on Defense Management, A Quest for Excellence: Final Report to the President*, 30 June 1986, <http://www.dtic.mil/get-tr-doc/pdf?AD=AD0766059> (accessed 14 June 2013), 364.

²⁴U.S. Small Business Administration, "The U.S. Small Business Administration," <http://www.sba.gov/> (accessed 20 June 2013).

Regulation was organized under Title 48 of the Code of Federal Regulations. This was done to “create a uniform structure for many federal agencies and to ensure purchasing procedures are standard, consistent, and conducted in a fair and impartial manner.”²⁵

At the time it was enacted, the National Security Act of 1947 was the most comprehensive piece of legislation to date and specifically stated:

In enacting this legislation, it is the intent of Congress to provide a comprehensive program for the future security of the United States; to provide for the establishment of integrated policies and procedures for the departments, agencies, and functions of the Government relating to the national security; to provide a Department of Defense, including the three military Departments of the Army, the Navy (including naval aviation and the United States Marine Corps), and the Air Force under the direction, authority, and control of the Secretary of Defense; to provide that each military department shall be separately organized under its own Secretary and shall function under the direction, authority, and control of the Secretary of Defense; to provide for their unified direction under civilian control of the Secretary of Defense but not to merge these departments or services; to provide for the establishment of unified or specified combatant commands, and a clear and direct line of command to such commands; to eliminate unnecessary duplication in the Department of Defense, and particularly in the field of research and engineering by vesting its overall direction and control in the Secretary of Defense; to provide more effective, efficient, and economical administration in the Department of Defense.²⁶

Prior to this legislation the military services functioned autonomously as two independent executive departments, the Department of War and the Department of the Navy. This stifled each service’s ability to effectively procure, research and develop new technologies. The services’ duplication of efforts tended to cause trouble when it came to the introduction of new technologies as well as being perceived as more expensive. So of the key points stated in the Declaration of Policy was for the service departments “to eliminate unnecessary duplication in the Department of Defense, and particularly in the

²⁵Ibid.

²⁶*National Security Act of 1947*, 5.

field of research and engineering by vesting its overall direction and control in the Secretary of Defense.”²⁷ The establishment of the Munitions Board and the Research and Development Board was the DoD’s solution to the problem. These boards were chaired by civilians with representatives from the service departments. The boards were thought to have been ineffective because they were complicatedly structured, which “prevented a clear line of civilian authority from the Secretary of Defense.” By 1953 the boards were thought to be so ineffective they were eliminated and the functions of the boards were transferred to the OSD.²⁸ Throughout the early and mid-1950s the procurement process of major weapons systems still remained decentralized throughout the DoD. Each department was still being allocated its own resources to develop and acquire major weapons systems for conflicts they anticipated in the future. There was little to no interference from the Secretary of Defense. David D. Acker the author of “The Maturing of the DoD Acquisition Process,” and member of Defense Systems Management College characterized the defense acquisition environment of the 1950s stating:

Money was authorized to develop almost any new defense system that appeared capable of giving the United States a performance advantage over any potential adversary. Such considerations as “should cost,” “design-to-cost,” and “life-cycle cost” were not uppermost in the minds of defense planners until the late 1950’s. Both development and production were carried out under cost reimbursement contracts. In this environment, production costs did not pose a major constraint on engineering design. When a design was discovered to be impractical in production—or to be inoperative in field use—it was modified in accordance with government funded engineering changes.

The lack of a well-organized and integrated DoD financial management system, along with the practice of “piecemeal” procurement, led to unstable employment in the defense industry and the emergence of a transient work force. Many of the

²⁷Ibid.

²⁸U.S. Congress, Senate, Committee on Armed Services, 530.

contractors being challenged to develop and produce defense systems on the outer fringes of technology found it difficult to create and maintain smoothly functioning program management teams.²⁹

Due to the idea that there needed to be greater involvement by the OSD in the acquisition process of major weapons systems, the National Security Act of 1947 was amended. The Department of Defense Reorganization Act of 1958 “authorized the defense secretary to assign the development, production, and operational use of weapon systems to any military department or service.” This legislation provided the framework for the increasing role of the OSD in the acquisition process.³⁰

1960s Reform

Secretary McNamara had been an executive at Ford Motor Company before taking over as Secretary of Defense. His goal was to centralize the resource allocation authority and planning process within the OSD. The OSD was also “given the responsibility for conducting cost-effective analysis of the different means to accomplish specific defense objectives.”³¹ The secretary and the service departments had three main improvements they wanted to make in the acquisition process they were: “program planning and selection, source selection and contracting, and management of ongoing acquisition programs.”³² He made several attempts at reforming the acquisition process

²⁹David D. Acker, “The Maturing of the DoD Acquisition Process,” *Defense Systems Management Review* (Summer 1980): 14.

³⁰Ronald J. Fox, *Defense Acquisition Reform, 1960–2009 An Elusive Goal* (Washington, DC: U.S. Army Center of Military History, 2011), 35.

³¹U.S. Congress, Senate, Committee on Armed Services, 532.

³²Fox, *Defense Acquisition Reform, 1960–2009 An Elusive Goal*, 35.

during his tenure as Secretary of Defense. In his attempts to centralize the functions of planning, programming, and budgeting he established what we now refer to as the Planning, Programming, and Budgeting System (PPBS). The main focus of the PPBS was to improve upon the decision making process when it came to the distribution of resources within the DoD. The PPBS was also an attempt to eliminate waste, prevent overlapping and duplicate weapons systems. DoD Directive 7045.14, *The Planning, Programming, and Budgeting, and Execution (PPBE) Process* states: “The ultimate objective of the PPBS shall be to provide the operational commanders-in-chief the best mix of forces, equipment, and support attainable within fiscal constraints.”³³ The second was the establishment of the Office of Systems Analysis. This organization was set up in large part as a reaction to the frequent cost overruns of the 1950s and early 1960s. At the time OSD was encouraging the use of fixed-priced and incentive based contracts. This was an “attempt to stimulate more rigorous control of costs.”³⁴ There were a large number of other acquisition reform programs attempted during McNamara’s tenure that resulted in mixed reviews. The failures in his programs were caused in great part due to the requirement to contract on a fixed-price basis. This caused problems in the bidding of contracts and caused cost overruns in major weapons systems programs. One of the most notable attempts was the establishment of the program manager concept. In testimony before the House Appropriations Committee in 1964, McNamara stated:

³³Department of Defense, Department of Defense Directive 7045.14, *The Planning, Programming, and Budgeting System* (Washington, DC: Government Printing Office, 22 May 1984), 9.

³⁴Fox, *Defense Acquisition Reform, 1960–2009 An Elusive Goal*, 36.

I want to look to a point of central control and information in the form of a program manager for each major weapon system . . . He shall be rewarded in his career for prompt and analytical disclosure of his problems as well as for his successes. This is a key position in our military departments, demanding the best managerial talents on which I want to place full reliance for our future weapons inventories.³⁵

Regrettably, due to the fact that the program managers lacked appropriate training and experience in business management and acquisitions the problems discussed earlier still plagued the acquisition process throughout the 1960s.

1970s Reform

As the 1960s came to a close there was still a lot of uncertainty and concerns that “inadequate ability to estimate and control costs and the lack of flexibility in the acquisitions process remained.”³⁶ McNamara’s tenure ended in February of 1968. After a short tenure by Clark Clifford, Melvin Laird, a representative from Wisconsin, who served on the House Appropriations Subcommittee on Defense, became the first Republican Secretary of Defense in eight years. Secretary Laird’s top priority when he took office was “to end the Vietnam War he inherited from the prior administration and to improve his department’s standing with the American people and Congress.”³⁷ He attempted to do this by implementing quick and sweeping changes throughout the DoD. One of the ways he intended to accomplish this was by appointment of David Packard, the head of Hewlett-Packard, as his deputy secretary of defense. As announced in the Congressional Record: “Packard was widely recognized as a management expert and was

³⁵Department of Defense, DoD Directive 7045.14, 39.

³⁶U.S. Congress, Senate, Committee on Armed Services, 532.

³⁷Fox, *Defense Acquisition Reform, 1960–2009 An Elusive Goal*, 42.

well regarded in his dealings with the Defense Department relating to the management of defense acquisition programs.”³⁸ Both men believed a number of improvements needed to be made to the acquisition process. Secretary Laird had a great deal of trust in his deputy and gave him free rein to manage research, development, and procurement functions within DoD. They also built a great team that consisted of former business executives and politicians that contributed to reform of the acquisition process. The major steps taken at the beginning of their tenure had an immense impact on the acquisition process. First was Laird’s establishment of the Blue Ribbon Panel (1969) and the second was Packard’s establishment of the Defense Systems Acquisition Review Council and DoD directive 5000.1, *The Defense Acquisition System*.

The Blue Ribbon Panel (1969) was made up of 16 members. The chairman was Gilbert W. Fitzhugh, chairman of Metropolitan Life Insurance Company and 15 other board members made up of attorneys, executives, professors and the National Football League commissioner. The goal was to have the findings completed by July 1970. The panel was established to study and to make recommendations on:

(1) The organization and management of the Department of Defense, including the Joint Chiefs of Staff, the Defense Agencies and the Military Services, as it affects the Department's mission performance, decision-making process, the command and control functions and facilities, and the coordination with other governmental departments and agencies, with emphasis on the responsiveness to the requirements of the President and the Secretary of Defense.

(2) The Defense research and development efforts from the standpoints of mission fulfillments, costs, organization, time and interrelation with the scientific and industrial community.

³⁸U.S. Congress, Senate, *Hearings before the Senate Armed Services Committee, Nominations of Laird, Packard, and Darden*, 91st Cong., 1st sess., 14 January 1969, 61-62.

(3) The Defense procurement policies and practices, particularly as they relate to costs, time and quality

(4) such other matters as the Secretary may submit to it from time to time.³⁹

The Defense Systems Acquisition Review Council was established to provide feedback on weapon system programs before moving through stages in the procurement process from commencement to production. The thought was that each service knew that if its programs had to pass through formal OSD reviews, it would “correct major deficiencies before bringing the program before a DSARC review.”⁴⁰ By the mid 1970s Secretary Packard had returned the responsibility of defining, developing, and producing systems that satisfy certain services needs back to the individual services. But the OSD continued to monitor program progress through the Defense Systems Acquisition Review Council process, and be responsible for policy. This way it could “decentralize the authority and responsibility to the services and the individual program managers.”⁴¹ Secretary Packard was committed to not allowing the OSD to interfere with the management of major weapons systems acquisition programs.

The Blue Ribbon Defense Panel released the *Report to the President and the Secretary of Defense on the Department of Defense*, on 1 July 1970. The report was lengthy and covered a breadth of issues. The Panel found that “The policies of the Department on development and acquisition of weapons and other hardware have

³⁹Gilbert W. Fitzhugh, *Report to the President and the Secretary of Defense on the Department of Defense*, 1 July 1970, <http://www.dtic.mil/get-tr-doc/pdf?AD=ADA013261> (accessed 14 June 2013), v.

⁴⁰Fox, *Defense Acquisition Reform, 1960–2009 An Elusive Goal*, 49.

⁴¹U.S. Congress, Senate, Committee on Armed Services, 533.

contributed to serious cost overruns, schedule slippages and performance deficiencies. The difficulties do not appear amenable to a few simple cure-alls, but require many interrelated changes in organization and procedures.”⁴² The panel concluded extensive changes were needed throughout the organization. The focus of the recommendations were to create subordinate secretaries under the deputy secretary. Those offices would include operations and resource management (under which acquisitions would fall) with assistant secretaries that would handle research and advanced technology and for engineering development. A third office would be in charge of evaluating a wide range of functions including accounting for weapon system performance and test and evaluation. Along with creating new offices for the Department of Defense Research and Engineering the panel felt that there needed to be more civilian managers. They also recommended the creation of a career path for program managers that included training and gave them greater authority. Laird and Packard generally agreed with most of the panel’s findings and recommendations except for the creation of more deputy secretaries. Packard’s belief was that such a move would create more top-level management, which would take away from the program manager’s ability to make decisions. It was not the decentralization of power he was looking for. In a speech a month after the panel’s findings were released he spoke at a defense industry event, he characterized the current procurement process as “a mess” he went on to say:

Let’s face it—the fact is that there has been bad management of many defense programs in the past. We spent billions of the taxpayers’ dollars; sometimes we spent it badly. Part of this is due to basic uncertainties in the defense business. Some uncertainties will always exist. However, most of it has been due to bad management, both in the Department of Defense and in the defense industry. We

⁴²Fitzhugh, 2.

can and are doing something about that. I am not talking just about cost overruns as so many of our critics do. Overruns are the end product of our mistakes rather than the key issue to be addressed. I am surprised that our critics took so long to discover cost overruns. They have been around a long time, and many of the cost overruns that receive the most publicity were organized by defense and industry years ago. We are now paying the price for mistakes in contracting, in development, and in management.

Frankly, gentlemen, in defense procurement, we have a real mess on our hands, and the question you and I have to face up to is what are we going to do to clean it up.⁴³

Throughout his tenure as deputy secretary Packard continued to fight for the empowerment of the program manager. He believed in giving the program manager almost total control of individual programs. He further believed this would result in services' managers retaining a high level of knowledge about a system and would have a lasting effect on the program.

On 13 July 1971 the DoD Directive 5000.1 was signed. It “applied to major acquisition programs only—those exceeding a development cost of more than \$50 million, a production cost of over \$200 million, or a program meeting some urgent national need.”⁴⁴ This document became central program planning and evaluation document. It was under this system that Department of the Army and National Aeronautics and Space Administration, in 1972 awarded Bell Helicopter a contract to develop two tilt rotor demonstrators designated XV-15. This experimental tilt rotor aircraft led to the eventual design concept of the V-22 Osprey. The services were instructed to use cost-type contracts in the development of high-risk programs. But once

⁴³Ibid., 69.

⁴⁴Department of Defense, Department of Defense Directive 5000.1, *Acquisition of Major Defense Systems* (Washington, DC: Government Printing Office, 13 July 1971), 7.

development had solved the major problems the services would attempt to use fixed-price agreements. Even though the XV-15 was considered a high-risk program it received the two fixed priced contracts of \$0.5M on 20 October 1972. This directive made monumental changes in the way the services identified needs, developed, assessed, produced systems and defined roles and responsibilities of acquiring major weapons systems. In September 1971, Packard stated that this directive “completed a major DoD-wide effort which included a review of OSD-level directives and instructions relating to systems acquisition.”⁴⁵ David Packard left office at the end of 1971 to return to his civilian life. Packard made great strides in the acquisition process during his tenure as deputy secretary. There were several other secretaries throughout the 1970s none of which made the impact of Laird and Packard. Following Laird and Packard’s tenure the rest of the 1970s were plagued with scandals like Watergate, turmoil within the OSD, and budget cuts. This made it very difficult to cut through the layers of bureaucracy that inhibited the decision-making processes. This continued throughout the rest of the 1970s and into the 1980s.

By April of 1977, the XV-15 made its first hover flight and, in July 1979, a full in-flight conversion from helicopter to fixed wing. In 1980, both demonstrators met their predicted speed and altitude of 300 knots and 16,000 feet respectively.⁴⁶ After a successful demonstration of the XV-15 at the Paris airshow in 1981 the program finally was gaining support and proved to be a major step in the evolution of the V-22 Osprey Program. Progress of the program was slow, yet the tilt rotor concept was gaining

⁴⁵Department of Defense, DoD Directive 5000.1, 77.

⁴⁶Smith, 5.

interest. The reason why the V-22 program gained such interest was a perception of military operational shortcomings in the early 1980s. The justification was a perceived need for an aircraft that would provide greater operational capabilities than the current rotary wing aircraft inventory.

The GNA

This bill fulfills the aims of President Eisenhower, who said almost three decades ago, “Separate ground, sea, and air warfare are gone forever . . . Strategic and tactical planning must be completely unified, combat forces organized into unified commands.” Congress rejected President Eisenhower’s appeals in the 1950s. Today, 36 years later, we can now report: mission accomplished.

This may be the last piece of legislation that I will have the honor to offer for consideration by the Senate. If it is, I will have no regrets. I will have had the privilege of serving in the Senate on . . . the day that our soldiers, sailors, airmen, and marines were given the organizational and command arrangements that will enable them to effectively accomplish their vital missions.⁴⁷

The 1980s began much like the 1970s ended. This was in large part do to the inability of prominent policymakers to deal with the U.S. military’s incapability of dealing with longstanding issues. The issues were the services inability to perform joint operations effectively and the inefficient and at times fraudulent system of acquiring weapons systems. These problems were demonstrated by the American military failures such as the Iran hostage rescue (1980), the Beirut Marine Barracks bombing (1983), and inter-service inoperability in Granada (1983). The government was dealing with military failures but reeling from the federal investigation called Operation Ill Wind. This operation led to the conviction of nearly 90 government officials and government contractors for bribery and other various crimes. These shortcomings would cause a

⁴⁷Barry M. Goldwater in Locher, “Taking Stock of Goldwater-Nichols.”

ripple effect that uncovered significant waste and inefficiency in the apparently continuous procurement and acquisition turmoil.

On 4 November 1980, California Governor Ronald W. Reagan, defeated incumbent Jimmy Carter to become the 40th President of the United States. He would make an attempt to increase the size and strength of the American force, which would result in the greatest and most expensive peacetime development of our armed forces in history. He appointed Caspar W. Weinberger as his Secretary of Defense. The economic environment that was set when he took office was one that acknowledged competition as the most effective means of weapons innovation but in actuality the economic environment diminished contractors' ability to operate without government control. This would cause "market distortions and mismatched incentives between a small number of very large firms and the Defense Department. These distortions encouraged institutional rigidity in the procurement process."⁴⁸ The heavy burden put on contractors would result in cost overruns, which in turn resulted in the contractors putting the cost directly back on government.⁴⁹

Much like his predecessors, Weinberger attempted to make sweeping changes in the defense acquisitions process. To assist him in reforming the acquisition process was his deputy secretary Frank C. Carlucci. They set out by creating the Acquisition Improvement Program, which "consisted of 32 management initiatives to address longstanding problems with major weapon systems acquisition, including significant cost

⁴⁸Fox, *Defense Acquisition Reform, 1960–2009 An Elusive Goal*, 98.

⁴⁹*Ibid.*

overruns and schedule slippages.”⁵⁰ Acquisition Improvement Program was an attempt to reduce cost, improve readiness, enhance future planning, establish accurate budgeting guidelines, encourage competition amongst contractors, and simplify the acquisition process and oversight by the military services and OSD. Weinberger also wanted to return to the services the responsibility and decision making authority for major weapon systems. One of the steps would be reforming PPBS. The overall objectives according to Carlucci in his talking points to the Defense Resources Board in February 1981:

To use the PPBS to improve the match between capabilities and the demands of our policies and national military strategy, to streamline the DoD decision making process by avoiding unnecessary revisiting of decisions and the resulting program instability, and to improve the material acquisition process by assessing the interface between PPBS and the acquisition system. This will require improved long-range planning in all aspects of the PPBS process. It will also require increased participatory management involving the Joint Chiefs of Staff and all of the Military services working together with the Secretary [of Defense]’s staff.⁵¹

This would “set in motion many of the reforms that OSD subsequently institutionalized in the Acquisition Improvement Program.”⁵² In an assessment of the progress of the Acquisition Improvement Program Carlucci wrote:

As I reflect over the past year, I am pleased to report significant progress toward our objective of improving the acquisition process. We have decreased the number of programs over which the Secretary of Defense retains decision-making authority; the principle of controlled decentralization is being embraced by the services. We have achieved economies in the acquisition process; major multi-

⁵⁰General Accounting Office, GAO/NSAID-86-148, *Defense Acquisition Improvement Program: A Status Report, Report to the Chairman, Committee on Government Affairs, United States Senate* (Washington, DC: U.S. General Accounting Office, July 1986), 1.

⁵¹Ronald J. Fox, “DRB (Defense Resources Board) Meeting, 2 February 1981, Talking Points—Carlucci,” in *Defense Acquisition Reform, 1960–2009 An Elusive Goal* (Washington, DC: U.S. Army Center of Military History, 2011), 102.

⁵²Fox, *Defense Acquisition Reform, 1960–2009 An Elusive Goal*, 106.

year procurements are in place, and selected programs have been restored to economic production rates. We have begun to make the defense marketplace more attractive to industry; flexible process payments are easing cash-flow problems, and increased investments in manufacturing technology are accelerating the pace of modernization. We have increased the readiness of our systems in the field; supportability and maintainability are being accorded the same emphasis as cost, schedule, and performance, and recent budget decisions provided additional resources to support the readiness of key systems.⁵³

The GAO was not as enthusiastic on the results of the program. Their findings in the 1986 DoD's *Defense Acquisition Improvement Program: A Status Report* were not as promising. They found that "the Congress had approved what amounts to nearly a 100-percent increase in DOD'S procurement budget from fiscal years 1980 to 1985 the largest peacetime increase in this Nation's history."⁵⁴ The GAO report concluded that "Although DOD has made some progress in implementing the program, implementation has not been completed, and consequently, results have not been fully achieved. If implementation is considered to be complete when action plans have been carried out and mechanisms for monitoring results established, implementation has not been completed on 23 of the 33 initiatives which has contributed to objectives having not been fully met for 29 or about 88 percent of the initiatives."⁵⁵

By the mid 1980s there was a reform movement led by several members in Congress. Senators Barry Goldwater, Sam Nunn, and William Cohen; and Congressmen Bill Nichols, Ike Skelton, and the late Les Aspin led this reform. The reform spearheaded studies such as *Defense Organization: The Need For Change*. This staff study was an in-

⁵³Frank C. Carlucci, "Foreword to Special Edition," *Concepts: The Journal of Defense Systems Acquisition Management* 5 (Summer 1982).

⁵⁴General Accounting Office, GAO/NSAID-86-148, 11.

⁵⁵*Ibid.*, 13.

depth look at defense reform and came up with 91 specific recommendations to solve the problems that were plaguing the DoD.

At the same time there was a public outcry over allegations that the acquisition system was failing in large part due to overpriced spare parts, test deficiencies, cost and schedule overruns and that oversight of the acquisition process was fading. This led President Reagan to take action and establish the Blue Ribbon Commission on Defense Management. This was in part due to the loss of public confidence in the effectiveness of the defense acquisition system. The former deputy secretary of defense who brought about sweeping changes in defense acquisition in the 1970s and Hewlett-Packard cofounder David Packard would head this new Blue Ribbon Commission. The Packard Commission would also be comprised of a group of defense experts who believed that sweeping changes were needed throughout the acquisition process. The experts believed control of management functions should be under civilian authority within the OSD. The defense acquisition program to date was thought to be costly and ineffective. The acquisition cycle was also an extremely lengthy process taking some major weapon systems up to 15 years for development. The commission said the “central problem from which most other acquisition problems stem:

- It leads to unnecessarily high costs of development. Time is money, and experience argues that a ten-year acquisition cycle is clearly more expensive than a five-year cycle.
- It leads to obsolete technology in our fielded equipment. We forfeit our five-year technological lead by the time it takes us to get our technology from the laboratory into the field.

- And it aggravates the very gold plating that is one of its causes. Users, knowing that the equipment to meet their requirements is fifteen years away, make extremely conservative threat estimates. Because long-term forecasts are uncertain at best, users tend to err on the side of overstating the threat.”⁵⁶

Overall the commission took a common sense approach to reform. The commission stated that: “Common sense must be made to prevail alike in the enactments of Congress and the operations of the department. We must give acquisition personnel more authority to do their jobs. If we make it possible for people to do the right thing the first time and allow them to use their common sense, then we believe that the department can get by with far fewer people.”⁵⁷ The Packard Commission knew it was critical to come up with recommendations that would make vast changes within the acquisition system. They needed to establish a system that would realize significant savings, eliminate hidden costs, prevent complexity, improve productivity, and improve professionalism. The Commission would come up with many recommendations to improve the acquisition process. These are the major recommendations:

Create a new Under Secretary of Defense for Acquisition, who would set overall policy for procurement and research and development (R&D), supervise the performance of the entire acquisition system, and establish policy for administrative oversight and auditing of defense contractors.

Establishing short, unambiguous lines of authority would streamline the acquisition process and cut through bureaucratic red tape. By this means, the Department of Defense (DoD) should substantially reduce the number of acquisition personnel.

The Joint Requirements and Management Board (JRMB) should be co-chaired by the Under Secretary of Defense (Acquisition) and the Vice Chairman of the Joint Chiefs of Staff. The JRMB should play an active and important role in all

⁵⁶Packard, *President’s Blue Ribbon Commission on Defense Management, A Quest for Excellence: Final Report to the President*, 47.

⁵⁷*Ibid.*, xxiv.

joint programs and in appropriate Service programs by defining weapons requirements, selecting programs for development, and providing thereby an early trade-off between cost and performance.

A high priority should be given to building and testing prototype systems and subsystems before proceeding with full-scale development.

DoD and Congress should expand the use of multi-year procurement for high-priority systems. This would lead to greater program stability and lower unit prices.”⁵⁸

Most of these recommendations would be incorporated into the GNA passed in 1986. Up to this point in the 1980s there had been several military operations, as discussed earlier, that seemed to highlight the inefficiency of the post-Vietnam military. The Packard commission and other influences came together in the mid-1980s and effected the acquisition situation dramatically.

The feeling throughout the military services was that reform was necessary. There had been growing concerns that some of the effects would put an even greater divide between the “military requirement process and a civilian run acquisition process.”⁵⁹ GNA completely restructured the way the DoD and the military services acquired military weapons systems. GNA made major changes on a wide range of areas to include acquisition of military equipment, military interaction between the services, and military counsel given to our civilian leadership. The bill passed with overwhelming bi-partisan support. President Ronald Reagan formally signed the GNA into law on 1 October 1986.

GNA comprises 87 pages of complex legislative language. Luckily, the congressionally directed approach was straightforward and clearly written in Conference

⁵⁸Packard, *President’s Blue Ribbon Commission on Defense Management, A Quest for Excellence: Final Report to the President*, xxiv-xxvi.

⁵⁹*Ibid.*, iii.

Report 99-824. The provisions led to the reorganization of the DoD and directed increase civilian authority in the Department. Implementation of the new law shifted and centralized the management of the weapons systems acquisition process to the senior ranking civilian as a presidential appointee. This appointee was given the title of Undersecretary of Defense for Acquisition. He was designated “the principal advisor to the Secretary of Defense on all matters pertaining to the Department of Defense Acquisition System.”⁶⁰ The GNA also gave all the responsibility for major weapon system acquisition to the service secretary of the individual military departments. For example, in Section 5014 the act states:

(c)(1) The Office of the Secretary of the Navy shall have sole responsibility within the Office of the Secretary of the Navy, the Office of the Chief of Naval Operations, and the Headquarters, Marine Corps, for the following functions:

- A. Acquisition.
- B. Auditing
- C. Comptroller (including financial management).
- D. Information management.
- E. Inspector General.
- F. Legislative affairs.
- G. Public affairs.⁶¹

Notwithstanding, the GNA was an honest attempt at acquisition reform. It appears that GNA improved military operations, although improvement was slow, after 1987. Yet when the focus is solely on acquisition reform the thought was that “performance continued to decline, and there have been concomitant slips in schedule, cost overruns,

⁶⁰Department of Defense, Department of Defense Directive 5000.1, *Major System Acquisitions* (Washington, DC: Government Printing Office, 12 March 1986), 8.

⁶¹*Goldwater-Nichols Department of Defense Reorganization Act of 1986*, 55.

and workforce deterioration.”⁶² The pressure to reform the acquisition process lasted well into the 1990s. This pressure to improve the acquisition process resulted in deep cuts in high dollar conventional weapons programs.

The V-22 and Acquisition Reform

Changing a large bureaucratic organization like the DoD is no easy task. They are steeped in culture and traditions. Change can be very difficult to implement. As discussed throughout this chapter the defense establishment went through many periods and administrations that tried to impose legislative reform and establish commissions that were focused on fixing perceived and real problems in defense acquisition policy.

The 1980s, prior to the Packard Commission and GNA was a time of immense defense build-up. Even though the OSD was looking at ways to reduce defense department spending, the need for advancement in certain major weapon systems technologies seemed to outweigh the cost. One of these emerging programs was the V-22 Osprey, begun in 1981. VTOL technology was not a new engineering concept. During the 1920s and 1930s, there were numerous innovative flying machines devised including several concepts that were expected to provide vertical takeoff and landing capabilities.⁶³ The program reemerged in the late 1940s and early 1950s. Early development of the aircraft fell under a joint venture between the U.S Army and U.S. Air Force Convertiplane program. By 1981 the DoD started what we now know as the V-22 program.

⁶²Nemfakos et al., 16.

⁶³Maisel et al., 5.

The impacts of the GNA led to a shift in the joint procurement effort where all services would assume the burden of cost of major weapons systems. Not only was the GNA supposed to allow for services to share cost, it was intended to allow the services to respond to perceived deficiencies in the ability to carry out military missions against a projected threat. The intended effects of passing the GNA were the elimination of waste, serious cost overruns, schedule slippages, performance deficiencies and stifling of competition for major weapon systems contracts. The development of major weapons system programs have fallen under scrutiny since the passing of the GNA and continue today.

CHAPTER 4

HISTORY OF THE V-22 OSPREY

Introduction

The first flight in 1903 by the Wright Brothers was the beginning of an era. Aviation was seen as a new frontier of discovery and innovation. The first pioneers of aviation were not only looking at conquering the realm of fixed-wing aviation, they were attempting to successfully master vertical flight as well. It was likely that the two would be put together in a design that could take off vertically like a helicopter and once airborne fly like an airplane.

VTOL technology emerged during the 1920s and 1930s. There were numerous innovative flying machines devised including several concepts that were expected to provide vertical takeoff and landing capabilities.⁶⁴ Due to the Second World War none of the concepts developed took hold. The quest to harness this technology reemerged in the late 1940s and early 1950s. The technology that civilians and military alike were looking for was to find an aircraft that could take off and land vertically, carry a fairly large number of passengers or troops, and transit at speeds and ranges of a fixed-wing aircraft.

Early military ventures in VTOL development fell under a joint venture with the U.S Army and the U.S. Air Force Model G-1 Convertiplane in 1952. There were several different variations of the program that were continued from the early 1950s to the first full scale funding of the program in 1981. In 1981 the DoD started what we now know as the V-22 program. The early stages of the program fell under Army leadership, with the

⁶⁴Ibid.

Navy/Marine Corps later taking the lead with full-scale development of the V-22 tilt rotor aircraft beginning in 1986. The program was started to fill a gap between traditional short-range helicopters and the need for a long-range aircraft. The challenge for early engineering designers was to find an “aircraft type that meets both the hover and cruise-mode performance criteria, while also meeting other operational, economic, and environmental requirements.”⁶⁵

Early Beginnings

The first attempt at harnessing VTOL technology was by Henry Berliner whose “design resembled a fixed-wing biplane of the period, except that it had a large diameter fixed-pitch propeller mounted on a vertical shaft near the tip of each wing.”⁶⁶ As you can imagine, the development of VTOL technology that emerged in the 1920s and 1930s was very rudimentary. The men who were attempting to develop this technology were true visionaries and dedicated to the concept of the tilt rotor aircraft. There were other inventors and countries during this time that recognized the benefits of developing tilt rotor aircraft, but due to funding issues and the Second World War they were discontinued.

The program reemerged in the late 1940s. Bell and McDonnell Douglas, the eventual designer and producer of the V-22, started design studies at this time based on the German tilt-rotor convertiplane project. The most significant development however, would come in 1947 when and the Delaware based Transcendental Aircraft Corporation

⁶⁵Ibid., 3.

⁶⁶Ibid., 32.

commenced development of the Model 1-G tilt rotor aircraft. This program had promising results that resulted in the first funding provided by the Army/Air Force in 1952. They were interested in flight data reports and analyses and hover testing. Unfortunately, on 20 July 1955 after completing nearly 100 flight hours in a year, Model 1-G crashed in Chesapeake Bay. Transcendental tilt rotor aircraft continued the program and made improvements but with limited results, this in turn resulted in the Air Force's withdrawal of funding for the Model 1-G. Developments in tilt rotor programs continued throughout the 1950s with the design and development of Bell Helicopter's XV-3, which had its first successful conversion from helicopter to airplane mode on 18 December 1958. The design was based on having twin 3-bladed rotor systems mounted at the tips of the wing. In helicopter mode the rotor blades would rotate in the horizontal plane. Then, when transitioning to forward flight, the rotor hub would be tilted forward 90 degrees and the rotor blades would rotate in a vertical plane like an airplane propeller. According to the National Aeronautics and Space Administration study "an assessment of the results of 13 years of flight, ground, and wind tunnel investigations with the XV-3 did not present a favorable prospect for the future of the tilt rotor aircraft."⁶⁷

⁶⁷Ibid., 17. The severely underpowered XV-3 had limited hover capability and cruise performance. The maximum level flight speed of 115 knots (155 knots in a dive) was not adequate to prove that the tilt rotor had a useful airplane mode capability. However, it was fortunate that the airplane-mode speed was so restricted since the aircraft would likely have been destroyed in flight, due to the rotor/pylon/wing aero elastic instability. The XV-3 also suffered from handling qualities problems, including lateral and roll instabilities when hovering in ground effect, and a directional divergent oscillation and poor control responses in the longitudinal and directional axes at low airspeeds. In addition, a complex gear shifting process, required to reduce rotor RPM after converting to the airplane mode (to improve rotor efficiency), produced an unacceptably high pilot workload.

Research and development continued throughout the 1960s but with minimal governmental assistance. In 1969 the Army established the Army Aeronautical Research Laboratory later designated the Army Air Mobility Research and Development Laboratory, which teamed with the National Aeronautics and Space Administration Ames Aeronautics and Flight Mechanics Directorate. This team “began a cooperative activity to address an array of tilt rotor aircraft aeromechanics issues and deficiencies that had surfaced during the flight and wind tunnel tests of the XV-3.”⁶⁸ This led to further wind tunnel testing by Bell at Ames wind tunnel testing facilities and further engineering and tilt rotor aeromechanics evaluations. Even though the XV-3 had varied results, it set the stage for further research and development in tilt rotor technology.

As a result of continued research, the Department of the Army and National Aeronautics and Space Administration awarded Bell Helicopter a contract in 1972 to develop two tilt rotor demonstrators both designated XV-15. In April of 1977, the XV-15 made its first hover flight, and in July 1979, a full in-flight conversion from helicopter to fixed wing. In 1980, both demonstrators met their speed and altitude requirements of 300 knots and 16,000 feet respectively.⁶⁹

Military Operational Deficiencies

By the early 1980s the tilt rotor concept was gaining interest. Slow progress was being made. There were several military operational shortcomings that occurred in the

⁶⁸National Aeronautics and Space Administration Office of Policy and Plans, *The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight* (Washington, DC: NASA History Division, 2000), 19.

⁶⁹Smith, 8.

early 1980s that led to the justification of an aircraft that delivered more operational capabilities than those in the current inventory. The military services were failing in the way that they conducted joint operations as well. This was apparent in the U.S. military response in Lebanon, operations in Grenada (Operation Urgent Fury), and the failed Operation Eagle Claw, to rescue American hostages in Iran. Indeed, the hostage crisis in Iran validated the need for an aircraft with the capabilities predicted by a platform like the V-22 Osprey. At the time of the operation, the U.S. was forced to rely on the Sikorsky RH-53 Sea Stallion helicopter for the hostage rescue attempt. The mission was to fly undetected nearly 900 miles across the Iranian dessert, which exceeded the operational range of any conventional helicopter, and perform the rescue of the U.S. hostages. At the time the RH-53 had no in-flight refueling capability. Since the aircraft had no inflight refueling capabilities the mission called for a covert landing of a C-130 aircraft on a provisional airstrip, to rendezvous with the helicopters and redeploy them to continue with the rescue operation. The mission was a complete failure. The mission caused the loss of several aircraft and eight servicemen. This mission brought the need for an aircraft with the capabilities of the V-22 tilt rotor aircraft to the forefront. The V-22 seemed to fill a gap in operational capabilities. These capabilities were tactical aerial refueling, night/all weather, and many other capabilities that the current inventory did not provide. These operational shortcomings provided compelling justification for the development of the V-22 Osprey.

The Evolution of the V-22 Osprey

After a successful demonstration of the XV-15 at the Paris airshow in 1981 the tilt rotor program finally gained support and proved to be a major step in the evolution of the

V-22 Osprey Program. One of these supporters was then Secretary of the Navy John Lehman, whose purview included the Naval Air Systems Command. He offered the Marine Corps his support to develop the XV-15 as the medium lift replacement helicopter. Another supporter to of this program was Senator Barry Goldwater (R-AZ), then Chairman of the Senate Armed Services Committee. After observing the performance of the aircraft at the Paris airshow the Senator requested a demonstration flight. His request was granted on 30 October 1981. He became the first non-test pilot to fly the aircraft and following the flight he said “the tilt rotor is the biggest advance in aviation in a quarter of a century.”⁷⁰

The Marine Corps had been looking for a replacement for their ageing H-46 Sea Knight fleet helicopters, and like all development programs, the V-22 program had to meet specific requirements for a capability. The Marine Corps requirement was the capability “to conduct amphibious warfare on short notice, at night, in adverse weather conditions, under emissions control from over the horizon (OTH) via air against distant inland targets.”⁷¹ The six main Marine Corps mission criteria for the V-22 were:

- Ability to execute a surprise attack;
- True OTH assault capability;
- Rapid concentration of forces;
- Extraction of forces;

⁷⁰Maisel et al., 92.

⁷¹“Stable Vision,” *Navy Times*, January 1991, 14. Emissions Control is a military order for radio silence.

- High survivability; and
- Night/all-weather capability.⁷²

The other services were looking for the aircraft to fulfill a variety of missions. The U.S. Navy's aircraft (HV-22) would provide a combat search and rescue capability and it also investigated a version for Anti-Submarine Warfare. The U.S. Air Force needed a Special Operations Aircraft (CV-22), and the U.S. Army (MV-22) versions forecast combat search and rescue capability, aeromedical evacuation, utility and logistics roles.

As part of the Reagan defense buildup the “Department of Defense (DoD) budget doubled, from \$142 billion to \$286 billion, between 1980 and 1985, although inflation accounted for 30 percent or more of that increase.”⁷³ In a memorandum sent by the Deputy Secretary of Defense to the service secretaries on 30 December 1981, the Joint Services Aircraft program was established. The services “regarded this memorandum as approval for concept formulation and waived the need for a justification for major systems new start, the formal need statement.”⁷⁴ The four-service joint program was established with the Under Secretary of Defense for Research and Engineering suggesting that the XV-15 could fulfill the missions of all the services. The Under Secretary of Defense for Research and Engineering directed the Navy take the lead on the joint services airframe while the Army took the lead on the modern technology engines to

⁷²“Top Marine Aviator Says Cheney Might Have Erred On V-22 Termination Decision,” *Inside Washington Publication*, 22 March 1990, 2.

⁷³General Accounting Office, GAO/NSIAD-88-135BR, *Major Acquisitions: Summary of Recurring Problems and Systematic Issues: 1960-1987* (Washington, DC: U.S. General Accounting Office, September 1988), 12.

⁷⁴General Accounting Office, GAO/NSAID-88-45S-7, 2.

be used on the aircraft. The Office of the Secretary of Defense “directed that the Army, Navy, and Air Force reprogram approximately \$1.5 million to conduct a joint technical assessment of the technology available for the joint services aircraft system.”⁷⁵ By June of 1982 the Army Chief of Staff had been selected as the Joint Services Program Manager.

On 4 June 1982 a memorandum of understanding regarding the joint services aircraft program was signed between the Army, Navy, and Air Force. This memorandum established funding and program objectives. The DoD provided \$167 million in fiscal year 1984 with each service providing a percentage of the funding. This memorandum “designated the Army as the executive service, and it required achievement of the earliest practical initial operational capability.”⁷⁶ The initial joint services operational requirement was approved on 14 December 1982. The requirements document set out by Under Secretary of Defense for Research and Engineering “called for an aircraft with a continuous cruise speed of not less than 250 knots and, to meet worldwide self-deployment objectives, a minimum range capability of 2,100 nautical miles, unrefueled. Anticipated acquisition quantities were approximately 1,100 for all three services.”⁷⁷ Once a contractor felt the requirements set forth could be met, a contract would be awarded.

On 26 April 1983, the combination of Bell-Boeing and Allison was awarded the contract to begin development of a tilt rotor aircraft. The bid proposed by Bell-Boeing

⁷⁵Ibid.

⁷⁶Ibid., 3.

⁷⁷Ibid., 4.

was the only one received. The original contract was granted on a cost-plus-incentive-fee basis, with incentives on cost only. The initial plan was to have two contractors competing for the contract and have a “fly off” to win the contract but due to the time allotted for the design phase there was no interest and competition other than Bell-Boeing for the contract.”⁷⁸

According to the GAO report from 1987 the opinions on why there were no other contracts submitted were:

Sikorsky Aircraft actively considered competing for the preliminary design, but at the last minute decided not to submit a proposal, leaving Bell-Boeing the only contender. According to Sikorsky officials, they did not submit a bid because the preliminary design stage did not allow them sufficient time to evaluate the technical risks of the program. Sikorsky believed they needed approximately 34 months instead of 23 months for preliminary design.

Grumman Aerospace officials indicated that, although competition was bred into the early stages of the program, it was lessened in the later stages as a result of the requirements driving the design toward the tilt rotor concept. Grumman did not fault anyone for this, calling it a “matter of service priorities.

A statement by the then Commander of the Naval Air Systems Command also addressed the question of why only one proposal was received:

As to why no other proposal was received, it can only be surmised. Even with the expansion of the initial effort to 23-months work, other industry management may have perceived that the Bell-Boeing’s lead and prior experience with tilt rotors was insurmountable. Even though NASA’s complete tilt rotor data package had been made available, they apparently felt that, without a further expansion of the effort, i.e. (33 months), the probability of winning was low. The Bell-Boeing team had put their company sources at risk and formed working teams while the program was still in the formative stages. No one else made a comparable commitment.⁷⁹

⁷⁸Ibid., 7.

⁷⁹Ibid., 7-8.

By 1984 the House Armed Service Committee agreed to continue funding the program for Fiscal Year 1984 at a cost of 88.6 million dollars. All funding had been consolidated under the Navy Research, Development, Test and Evaluation team. The “funding consolidation was intended to strengthen the program by assigning control of the funds directly to the service with executive leadership.”⁸⁰ Funding for the V-22 program continued for Fiscal Year 1985 \$188.5 million and in Fiscal Year 1986 at \$580 million.

When looking at the analysis from *Performance of the Defense Acquisition System, 2013 Annual Report* it appears the Bell-Boeing V-22 Osprey is the most expensive weapons system program to date. The incorporation of new technologies such as tilt rotors, composite airframe, and fly-by-wire digital controls made the V-22 the most technologically advanced aviation acquisition programs of its time. Not only was the program dealing with technological challenges but also in the midst of a battle with Congress and policy makers on their “dissatisfaction with the perceived stubbornness of U.S. military leaders’ refusal to deal with long-festered problems.”⁸¹ Congress was also annoyed at the service’s performance of effective joint operations, and was frustrated with the fraudulent system of acquiring weapons systems.

There were goals established at the beginning of the Reagan presidency for the acquisition process. The broad goals of the administration included the ability to reduce costs, increase competition among contractors, efficient production rates, improved long-range planning and overall streamlining of the acquisition process and improve oversight

⁸⁰Ibid., 9.

⁸¹Nemfakos et al., xi.

within the OSD. These goals were ambitious as OSD had been struggling with acquisition reform for the last four decades. Due to the fact that the administrations goals were not succeeding and public outcry over allegations the acquisition system was failing. In large part due to: overpriced spare parts, test deficiencies, cost and schedule overruns and the oversight of the acquisition process. This led President Regan to take action and establish the Blue Ribbon Commission on Defense Management. Ultimately the Commission's recommendations led to the implementation of the GNA. This reform was one of the most comprehensive pieces of acquisition reform and was formally signed into law by President Ronald Reagan on 1 October 1986.

The GNA could have had huge impacts on the V-22 program due to the fact that it was in the midst of its development phase and the OSD was supposedly looking to reduce costs in the 1980s. The increased competition among contractors (only one contractor competing for the design), efficient production rates (did not commence production until 17 years later), improved long-range planning and overall streamlining of the acquisition process was supposed to fix the problems. Somehow, the Marines guarded the V-22 from budget cuts over the next two and a half decades.

May 1988 proved to be a historical milestone for the V-22. It was on this date that the V-22 took its first flight. 1988 was also the year the Army decided to drop the V-22 program to continue its development of the Light Helicopter Experimental program. The battle had now begun for the life of the V-22. There were several key supporters in Congress who organized opposition to the cancellation of the program. Against them was arrayed the Secretary of Defense Richard "Dick" Cheney. His initial guidance from

President George W. Bush was to “wield the budget axe.”⁸² Cheney’s criteria for program merit appeared to be affordability. In 1991 a *Washington Post* article reported:

Cheney claims an all-time record as Defense Secretary for canceling or stopping production. At last count, he said, he has put an end to more than 100 systems . . . Pentagon officials say the weapons (being terminated) are based on 1970s-era technology and the 1990s should be a “decade of development, more than of production,” as Defense Secretary Richard B. Cheney has put it. And, there’s a very firm and unbending commitment to advanced technology.⁸³

Despite strong opposition between the first flight in May 1988 and the middle of 1991, five prototypes accumulated 550 flight hours. Things were going well with the program when tragedy struck on a test flight on 11 June 1991. A tilt rotor prototype crashed just three minutes after its first flight lift-off. Luckily the crew walked away with minor injuries. As after all test aircraft crashes, the testing team suspended all flights pending the investigation. Unfortunately this would not be the only setback and crash of the V-22. Only 13 months had gone by since the previous crash when the test flight of prototype No. 4 proved to be fatal. On a scheduled operational test flight on 12 July 1992 the right engine of prototype No. 4 failed causing the aircraft to crash in the Potomac River killing all seven crew on board. Following this crash the program would be suspended for 11 months. Notwithstanding this setback, Congress supported the V-22 program. By 1997 the Defense Acquisition Board had authorized the first lot of aircraft for low-rate initial production.

⁸²“Cheney’s Reputation for Compromise Seen as Budget-Task Plus,” *Fort Worth Star Telegram*, 15 April 1989, 20.

⁸³Barton Gellman, “Standing Down: America’s Military in Transition,” *The Washington Post*, 8 December 1991.

On 16 July 1998 the Navy Acquisition Executive approved the Acquisition Program Baseline with the program cost for the V-22 aircraft at approximately \$53 billion (1998 dollars). The V-22 Operational Test and Evaluation began on 1 November 1999. The V-22 Program Manager was striving toward a Milestone III full-rate production decision in October 2000.⁸⁴ According to the Office of the Inspector General, DoD report published in August of 2000:

December 31, 1999, the Program Management Office estimated the program acquisition unit cost for 458 V-22 aircraft was \$55 million each (FY 1986 base-year dollars), which was 6.3 percent more than the Acquisition Program Baseline estimate of \$52 million each for 523 aircraft. However, when escalation is considered, the Program Management Office estimate per unit cost for 458 V-22 aircraft was \$83.2 million (then-year dollars), which was 17.8 percent less than the Acquisition Program Baseline estimate of \$101.2 million for 523 aircraft.⁸⁵

In April of 2000 tragedy struck again when a pilot lost control and commenced a high rate of descent killing all 19 Marines onboard. Then in December on a night approach another aircraft crashed killing all four Marines on board. In January allegations of falsified maintenance reports proved true. The squadron commander admitted falsifying records for two years. Then in September three more Marines were found guilty of falsifying maintenance records. As a result the secretary of defense for acquisition announced a new two-year flight test program for the V-22. The justification for continuing the program was its capabilities. The thinking was that fundamentally the VTOL concept was not flawed. To disagree with this point was to say that tilt rotor

⁸⁴Office of the Inspector General, Report No. D-2000-174, *Department of Defense: V-22 Osprey Joint Advanced Vertical Aircraft* (Washington, DC: Office of the Inspector General, 15 August 2000), 2.

⁸⁵*Ibid.*

technology was still experimental and neither safe nor reliable for operational employment.

In May 2001 as a result of these events a Blue Ribbon panel was formed by then Secretary of Defense William Cohen, to review all aspects of the V-22 program. This panel was commissioned to investigate issues with V-22 development and report its findings and recommendations during congressional testimony. “The panel recommended cutting production to the ‘bare minimum’ while an array of tests was carried out to fix a long list of problems they identified with hardware, software and performance.”⁸⁶ The results of the investigation which were published in July 2001 reported to the DoD Inspector General that it had found evidence that a V-22 squadron at Marine Corps Air Station New River, North Carolina, falsified maintenance and readiness records. After a two-year grounding that began with the crash in April 2001 and the Blue Ribbon panel recommendations complete, the Marines resumed operational testing.

The V-22 program succeeded in reaching key milestones in the fall of 2005. This led to the announcement by the Office of Operational Test and Evaluation that the V-22 had successfully completed operational testing and was ready to conduct its primary missions. After this announcement “the Under Secretary of Defense for Acquisition told Congress, that the Osprey was operationally fit, and on September 28, the Defense Acquisition Board approved full rate production.”⁸⁷ As a result, DoD’s budget request for Fiscal Year 2007 was the production of 16 V-22. This was the first year since the Blue

⁸⁶Christopher Bolkon, *Tactical Aircraft Modernization* (Washington, DC: Congressional Research Service, 8 June 2007), 9.

⁸⁷*Ibid.*, 10.

Ribbon Panels endorsement in that, DoD proposed building more Ospreys than the “minimum sustainable rate.”⁸⁸ Ultimately, the MV-22 achieved IOC with the Marine Corps in June 2007. The CV-22 achieved IOC with the Air Force in March 2009.

⁸⁸Bolkon, 10.

CHAPTER 5

CONCLUSION AND RECOMENDATIONS

A significant historical milestone was marked when the GNA was signed into Public Law on 1 October 1986. Early legislation such as the National Security Act of 1947 was the foundation to establish the organizational structure upon which the GNA was built. Congress enacted GNA to establish the roles and responsibilities of the civilian and military leadership and to improve efficiency in the use of defense resources. It has proven to be one of the most significant pieces of legislation enacted on defense acquisition reform to date. Since its implementation the DoD has continued to evolve and is still attempting to transform for the uncertainties of the 21st century and beyond.

Changing a large bureaucratic organization like the DoD is no easy task. It is steeped in culture and traditions, even though it is less than 70 years old; change can be very difficult to implement. As discussed throughout this thesis, the defense establishment went through many periods and numerous administrations that tried to impose legislation and establish commissions focused on fixing perceived and real problems in defense acquisition policy. The GNA was successful in identifying the need for a more joint force to conduct military operations and major weapon system acquisitions to support those operations. It also improved the mechanism for military advice given by the military services' leadership to the Commander in Chief to conduct joint military operations and promoted better management practices, encouraged more realistic estimates, thorough testing, and accurate reporting. The historical research in this paper suggests that though these practices were recognized as improving acquisition management, they were not widely adopted and were inconsistent. These weaknesses are

reflected in the history of the V-22 acquisition and procurement. James R. Locher III, one of the architects of GNA, assessed that “Testimony before Congress revealed that vague and ambiguous DOD objectives permitted service interests rather than strategic needs to play the dominant role in shaping resource decisions.”⁸⁹ This was evident by Congress agreeing with the Marine Corps argument that it required this technology to support future operations. Another shortcoming in the acquisition reform process was not adopting the recommendations of the Packard Commission report for the Joint Requirements and Management Board the predecessor to the Defense Acquisition Board Review and Joint Review Oversight Council to “play an active and important role in all joint programs and in appropriate service programs by defining weapons requirements, selecting programs for development, and providing thereby an early tradeoff between cost and performance.”⁹⁰ Nowhere in GNA is this recommendation found. Since that recommendation was not adopted in the GNA, and therefore not properly implemented, the GNA had little to no effect on acquisition and production of the V-22. By not implementing this recommendation, it allowed the V-22 program to enter “Engineering and Manufacturing Development (EMD) without proper authorization, a DAB review, a validated requirement, or a valid acquisition program baseline.”⁹¹ The inability to implement and enforce components of the law related to acquisition was another contributing factor. The GNA had little to no impact on acquisition and production of the

⁸⁹Locher, 14.

⁹⁰Packard, *President’s Blue Ribbon Commission on Defense Management, A Quest for Excellence: Final Report to the President*, xxv.

⁹¹Office of the Inspector General, Report No. D-2000-174, 7-8.

V-22. This inability caused a significant disconnect between the operational world and that of acquisition, especially in testing, and resulted in development being over required timelines for delivery of the capability. These inefficiencies were one of the causal factors in the V-22 program resulting in 25 years to accomplish IOC. It did not help that the Deputy Secretary of Defense waived the program justification for major weapon's system, i.e. the formal need statement. Additionally the unusual political factors that program encountered throughout its development played an important role in the failure of the law to effect the continuation of the program. Finally, it was evident that the fundamental elements of the acquisition process the GNA was supposed to enforce were abandoned or ignored when it came to the V-22 program.

Despite the GNA and reforms in the 1990s the same acquisition issues arose throughout the program's development: substantial cost growth, schedule slippage, and technical performance shortfalls. In the case of the V-22, the Secretary of Defense even excluded the program from DoD's budget request, believing they were not the most cost-effective solutions to the mission needs. Nevertheless, Congress continued to agree with the Marine Corps' argued need for this new weapon system and provided funding. One of the most likely scenarios of how the program survived was that in the 1990s there were "thirty-five former Marines and active reservists in Congress and forty states had an economic incentive to produce the V-22."⁹² In addition, the GAO reported in the 1990s that to "protect programs from criticism; the services were reluctant to provide OSD with

⁹²Fosnaugh, 8.

current program information, such as updated cost estimates.”⁹³ Not only did the V-22 experience issues with the DoD it experienced a number of development challenges relating to safety, program management and affordability. Political supporters in Congress were a major factor in the GNA not being adhered to when it came to the V-22 program.

It also appears that developing the technology was in fact a reaction to failed operations in the 1980s. i.e. Operation Eagle Claw. A more cost efficient method would have been to simply improve upon or rely upon technologies that were already available in current use or from foreign of civilian markets. This is what the Army did when it backed out of the program to concentrate on improving existing capabilities. But it is not that easy when you have an interest group such as the Marine Corps and its various political lobbyists advocating the need for this technology to support future operations. The power of the Marine-backed V-22 political lobby had significant allies in Congress. GNA seems to have been helpless against the lobby. It’s justification in a perceived requirement “to conduct amphibious warfare on short notice, at night, in adverse weather conditions, under emissions control from over the horizon (OTH) via air against distant inland targets.”⁹⁴ Was this justification for a high cost, unproven technology validated by the requirement for a capability, or an expanded capability, to perform amphibious landings? This paper suggests that not all the perceived requirements that were set forth

⁹³Ronald J. Fox, *Program Manager. Journal of the Defense Systems Management College* 24, no. 4, DSMC 127 (July-August 1995), in *Defense Acquisition Reform, 1960–2009 An Elusive Goal* (Washington, DC: U.S. Army Center of Military History, 2011), 192.

⁹⁴“Stable Vision,” 14.

by the Marine Corps were met. Capabilities such as performing surprise attacks. This is requirement was not justified by the amount of noise the V-22 actually makes. To be highly survivable is debatable because the V-22 has no capability of gliding to a landing like a fixed wing aircraft and cannot autorotate like a helicopter. The ability to rapidly concentrate forces, the aircraft does hold up to 24 soldiers maximum, which would be reasonable for a quick reaction force but to insert any force of size would take a considerable amount of aircraft. That does not take into account the questionable maintenance record of the aircraft. As far as filling roles of other services such as the Navy's anti-submarine warfare and the Air Force's Combat Search and Rescue the cost and capability was not a justifiable reason to bring this weapon system on line. The Navy and Air Force ability to improve upon existing platforms such as the Sikorsky H-60 upgrades has proven to be the most cost efficient method of improving their capabilities for the future. Nevertheless, in a time of decreasing defense resources and the services struggling to maintain relevance in an ever-changing world environment may cause services to become parochial. This view may cause a regressive slip to pre-GNA problems.

Final Thoughts

Despite well-meaning attempts over the past 27 years, today's acquisition culture, as in 1986, has changed very little since enactment of the GNA. Things have improved somewhat with the services receiving a mix of forces, equipment, and support attainable within our fiscal constraints. But there is still a need to eliminate waste, prevent overlapping and duplicate weapons systems, which was one of the major concerns of the 1980s and still is today. The difference is that weapons cost more (2013 dollars), take

longer to field and often encounter performance problems. This means that the defense acquisition system still has a problem with not developing and fielding reliable military capabilities in a timely and cost effective manner. The reform that was implemented in GNA was supposed to address these problems. It has barely addressed them, and in some cases the situation is worse when it comes to acquisition reform.

It is undeniable that V-22 cost had risen substantially above initial projections. By the time the V-22 achieved IOC in June 2007 it had taken 25 years to reach that milestone and taken the lives of 21 people. In a 2009 GAO report “1986 estimates (stated in fiscal year 2009 dollars) that the program would build nearly 1000 aircraft in 10 years at \$37.7 million each have shifted to fewer than 500 aircraft at \$93.4 million each—a procurement unit cost increase of 148 percent. Research, development, testing, and evaluation costs increased over 200 percent. To complete the procurement, the program plans to request approximately \$25 billion (in then-year dollars) for aircraft procurement.”⁹⁵

There is no doubt that the GNA impacted the V-22 program; although this influence was probably not in the way GNA’s authors intended based on the review conducted here. One of the intended results that was done correctly was the establishment a joint procurement effort with a Joint Requirements Oversight Council where all services would bear the burden of cost. But other intended effects that did fail were the elimination of waste, serious cost overruns, schedule slippages, performance deficiencies and stifled competition for major weapon systems contracts as we see in developing the

⁹⁵Jeremia J. Gertler, *V-22 Osprey Tilt-Rotor Aircraft* (Washington, DC: Congressional Research Service, 25 November 2009), 10.

V-22. This was a basic failing of the GNA as a quality control measure for demonstrably problematic weapons program.

In conclusion, given the real decline in U.S. defense spending that always occurs after the conclusion of major wars, it will be extremely difficult to maintain a viable state-of-the-art defense industrial base. The American military establishment must take advantage of the potential for Foreign Military Sales and more importantly, commercial applications to cut down on the cost of major weapons system acquisitions. As we have seen through the research and history provided, the V-22 program was not the most cost effective venture on military grounds alone, but the technology generated for the national industrial base may have been incentive enough to continue with the program. In the future we must ensure that Congress continues to provide joint funding for programs such as the V-22 as a means of maintaining the U.S. leading technological position among developed countries. For a variety of technological, economic, and political reasons, the future promises considerable change in the planning for and execution of naval special warfare. In order to confront and solve these problems of the future, new technology, of which the tilt rotor is still one, offers excellent potential if the military establishment can get it right.

Recommendations for Further Research

This thesis's limited scope highlighted areas for further study. The recommendations are in three areas: further historical case studies; further research on current analysis of defense reform and how it impacted major weapons systems procurement; and further research on the impact of weapons systems capabilities. First, for the GNA, this study focused on how the DoD let the implementation of the GNA give

way to political lobby's and more research is needed on these dynamics. Additionally a comparative study of how U.S. allies, for example Great Britain, have dealt with defense reform would be useful. Has U.S. defense reform differed from their experience? Additionally, how have other nations' experiences affected the way U.S. acquires major weapon systems?

Additionally, an analysis is needed to determine actual maintenance cost versus the planned maintenance costs of the V-22 and whether or not the benefits of the platform outweigh the cost of improving existing technology? This further research could include gathering of cost maintenance and cost per flight hour of the V-22 vice existing technology that is capable of fulfilling the same missions. A comparative study of the capabilities of the V-22 Osprey versus how the technology accomplished its initial goals is also warranted.

But a question still remains: Were the costs and continuing costs (current procurement and maintenance cost) and capabilities it brings to the table necessary to fight the next conflict? This paper suggests that this weapon system has had virtually no impact on past and recent operations due to excessive cost overruns and significant schedule delays. This question also needs further research. The jury is still out and perhaps in future operations we will see if the V-22 satisfied the needs of our operational military forces.

Finally, since one of the main failures of the GNA was the implementation of the law, research is need on the mechanisms by which the Navy and Marine Corps have found ways to circumvent it. Will the current structure of today's acquisition oversight body co-chaired by the Assistant Secretary of the Navy (Research, Development and

Acquisition) and Vice Chief of Naval Operations prevent the same thing from happening when it comes to acquiring major weapons systems? Further research into any of these areas would expand the understanding of how the acquirement of major weapons systems in the past and present can affect such a large bureaucracy and future military operations.

APPENDIX A

RECOMMENDATIONS AND LEGISLATION

President's Blue Ribbon Commission on Defense Management (Packard Commission) Recommendations

Notwithstanding our view that the Secretary of Defense should be free to organize his Office as he sees fit, we strongly recommend creation by statute of the new position of Under Secretary of Defense (Acquisition) and authorization of an additional Level II appointment in the Office of the Secretary of Defense. This Under Secretary, who should have a solid industrial background, would be a full-time Defense Acquisition Executive. He would set overall policy for procurement and research and development (R&D), supervise the performance of the entire acquisition system, and establish policy for administrative oversight and auditing of defense contractors.

The Army, Navy, and Air Force should each establish a comparable senior position filled by a top-level civilian Presidential appointee. The role of the Services' Acquisition Executives would mirror that of the Defense Acquisition Executive. They would appoint Program Executive Officers (PEO), each of whom would be responsible for a reasonable and defined number of acquisition programs. Program Managers for these programs would be responsible directly to their respective PEO and report only to him on program matters. Each Service should retain flexibility to shorten this reporting chain even further, as it sees fit.

Establishing short, unambiguous lines of authority would streamline the acquisition process and cut through bureaucratic red tape. By this means, the Department of Defense (DoD) should substantially reduce the number of acquisition personnel. Congress should work with the Administration to recodify all federal statutes governing procurement into a single government wide procurement statute. This recodification should aim not only at consolidation, but more importantly at simplification and consistency.

DoD must be able to attract, retain, and motivate well-qualified acquisition personnel. Significant improvements, along the lines of those recommended in November 1985 by the National Academy of Public Administration, should be made in the senior-level appointment system. The Secretary of Defense should have increased authority to establish flexible personnel management policies necessary to improve defense acquisition. An alternate personnel management system, modeled on the China Lake Laboratory demonstration project, should be established to include senior acquisition personnel and contracting officers as well as scientists and engineers. Federal Regulations should establish business related education and experience criteria for civilian contracting personnel, which will provide a basis for the professionalization of their career paths. Federal law should permit expanded opportunities for the education and training of all

civilian acquisition personnel. This is necessary if DoD is to attract and retain the caliber of people necessary for a quality acquisition program.

The Joint Requirements and Management Board (JRMB) should be co chaired by the Under Secretary of Defense (Acquisition) and the Vice Chairman of the Joint Chiefs of Staff. The JRMB should play an active and important role in all joint programs and in appropriate Service programs by defining weapons requirements, selecting programs for development, and providing thereby an early tradeoff between cost and performance. Rather than relying on excessively rigid military specifications, DoD should make much greater use of components, systems, and services available “off the shelf.” It should develop new or custom made items only when it has been established that those readily available are clearly inadequate to meet military requirements.

A high priority should be given to building and testing prototype systems and subsystems before proceeding with full-scale development. This early phase of R8cD should employ extensive informal competition and use streamlined procurement processes. It should demonstrate that the new technology under test can substantially improve military capability, and should as well provide a basis for making realistic cost estimates prior to a full-scale development decision. This increased emphasis on prototyping should allow us to “fly and know how much it will cost before we buy.”

The proper use of operational testing is critical to improving the operations performance of new weapons. We recommend that operational testing begin early in advanced development and continue through full-scale development, using prototype hardware. The first units that come off the limited rate production line should be subjected to intensive operational testing and the systems should not enter high rate production until the results from these tests are evaluated.

To promote innovation, the role of the Defense Advanced Research Projects Agency should be expanded to include prototyping and other advanced development work on joint programs and in areas not adequately emphasized by the Services. Federal law and DoD regulations should provide for substantially increased use of commercial style competition, relying on inherent market forces instead of governmental intervention. To be truly effective, such competition should emphasize quality and established performance as well as price, particularly for Research and Development and for professional services.

DoD should fully institutionalize “base lining” for major weapon systems at the initiation of full-scale engineering development. Establishment of a firm internal agreement or baseline on the requirements, design, production, and cost of weapon systems will enhance program stability.

DoD and Congress should expand the use of multi-year procurement for high priority systems. This would lead to greater program stability and lower unit prices.

DoD must recognize the delicate and necessary balance between the government's requirement for data and the benefit to the nation that comes from protecting the private sector's proprietary rights. That balance must exist to foster technological innovation and private investment, which is *so* important in developing products vital to our defense. DoD should adopt a data rights policy that reflects the following principles:

- If a product has been developed with private funds, the government should not demand, as a precondition for buying that product, unlimited data rights even if the government provides the only market. The government should acquire only the data necessary for installation, operation, and maintenance.
- If a product is to be developed with joint private and government funding, the government's needs for data should be defined during contract negotiations. Government contribution to development funding should not automatically guarantee it rights to all data.
- If a product is developed entirely with government funds, the government owns all the rights to it but may under certain circumstances make those rights available to the private sector.

The President, through the National Security council, should establish a comprehensive and effective national industrial responsiveness policy to support the full spectrum of potential emergencies. The Secretary of Defense, with advice from the Joint Chiefs of Staff, should respond with a general statement of surge and mobilization requirements for basic wartime defense industries, and logistic needs to support those industries and the essential economy. The DoD and Service Acquisition Executives should consider this mobilization guidance in formulating their acquisition policy, and program managers should incorporate industrial surge and mobilization considerations in program execution.⁹⁶

Goldwater-Nichols Department of Defense Reorganization Act of 1986

1. Improve the military advice provided to the President, the National Security Council, and the Secretary of Defense;
2. Place clear responsibility on the commanders of the unified and specified combatant commands for the accomplishment of missions assigned to their commands;
3. Ensure that the authority of the commanders of the unified and specified combatant commands is fully commensurate with the responsibility of those commanders for the accomplishment of missions assigned to their commands;

⁹⁶Packard, *President's Blue Ribbon Commission on Defense Management, A Quest for Excellence: Final Report to the President*, xxiv-xxvi.

4. Increase attention to the formulation of strategy and to contingency planning;
5. Provide for more efficient use of defense resources;
6. Improve joint officer management policies; and
7. Enhance the effectiveness of military operations and improve the management and administration of the Department of Defense.⁹⁷

⁹⁷*Goldwater-Nichols Department of Defense Reorganization Act of 1986*, 3-4.

APPENDIX B

AIRCRAFT

Early Aircraft Designs



Figure 1. Henry Berliner Tilt-Propeller Helicopter

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of the XV-15 Tilt Rotor Research Aircraft from Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), 6.



Figure 2. McDonnell XV-1 Compound Helicopter

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, "The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight" (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Boeing Photograph AD98-0209-13, 4.



Figure 3. Platt LePage XR-1A Lateral Twin-Rotor Helicopter

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, "The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight" (National Aeronautics and Space Administration History Division, Washington, DC, 2000), 9.

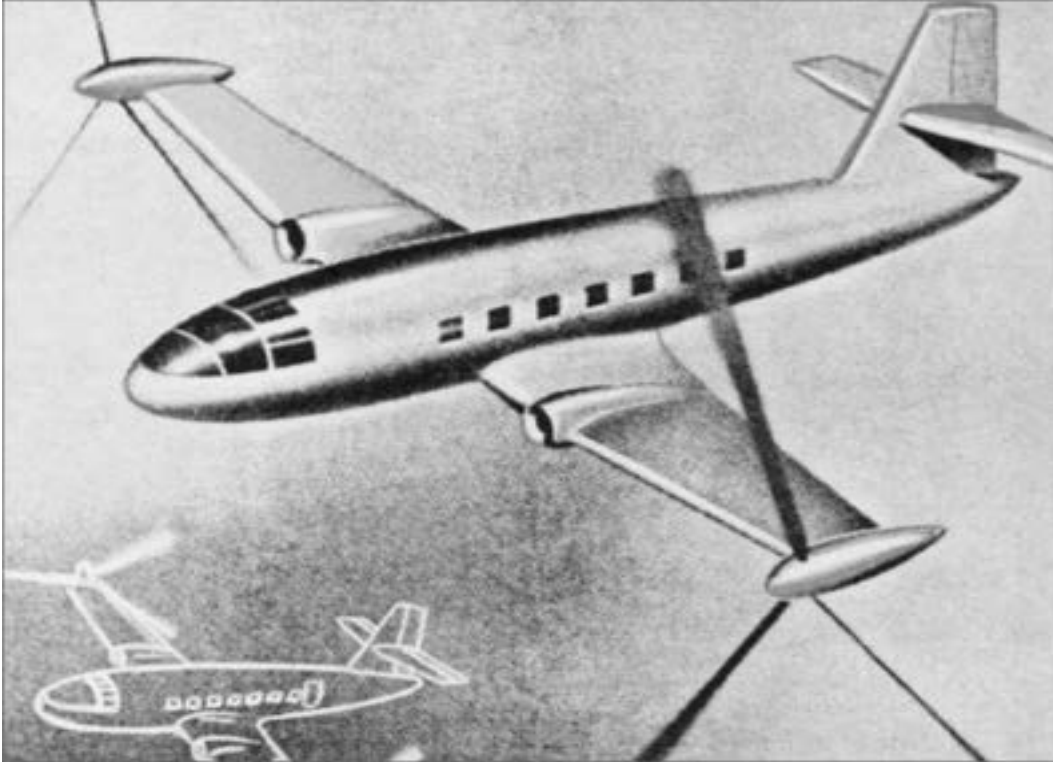


Figure 4. Platt LePage Tilt Rotor Transport Aircraft Design

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Boeing Print-Ames AD98-0209-22, 9.

United States Patent Office

2,702,168

CONVERTIBLE AIRCRAFT

Haviland H. Platt, New York, N. Y.

Application July 7, 1950, Serial No. 172,507

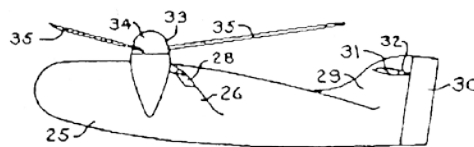
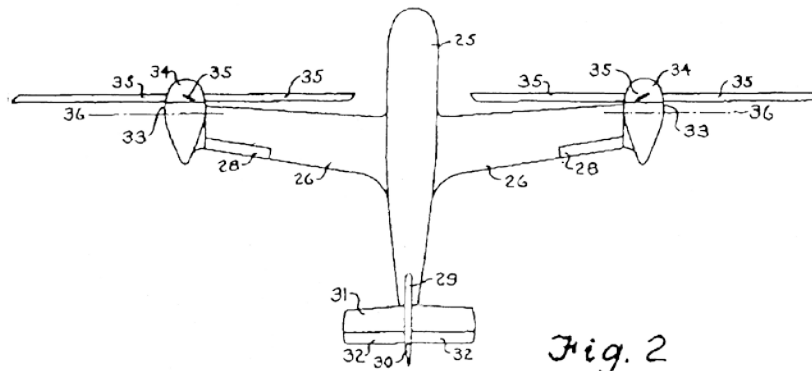
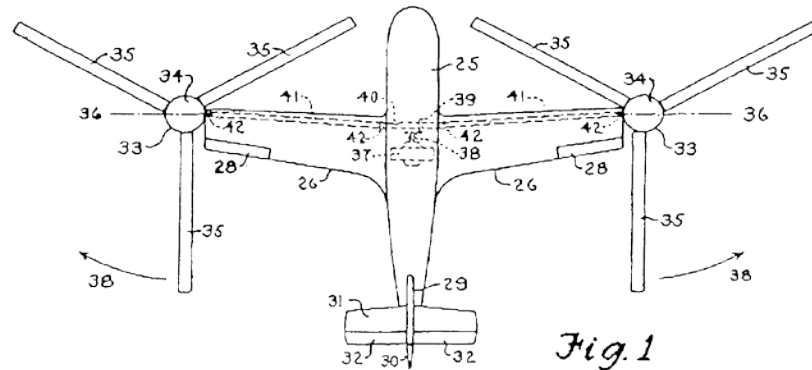


Fig. 3

INVENTOR.
HAVILAND H. PLATT
BY *Howard L. Kellish*
ATTORNEY.

15 Claims. (Cl. 244--7)

Figure 5. Illustration from the Haviland Platt Patent of the Tilt Rotor Concept

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, "The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight" (National Aeronautics and Space Administration History Division, Washington, DC, 2000), 10.

XV-3 Aircraft



Figure 6. Bell Helicopter XV-3 Tilt Rotor Aircraft

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Bell Photograph 209854, 5.



Figure 7. Crash of the XV-3 on 25 October 1956

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Bell Photograph 217259, 13.

XV-15 Aircraft

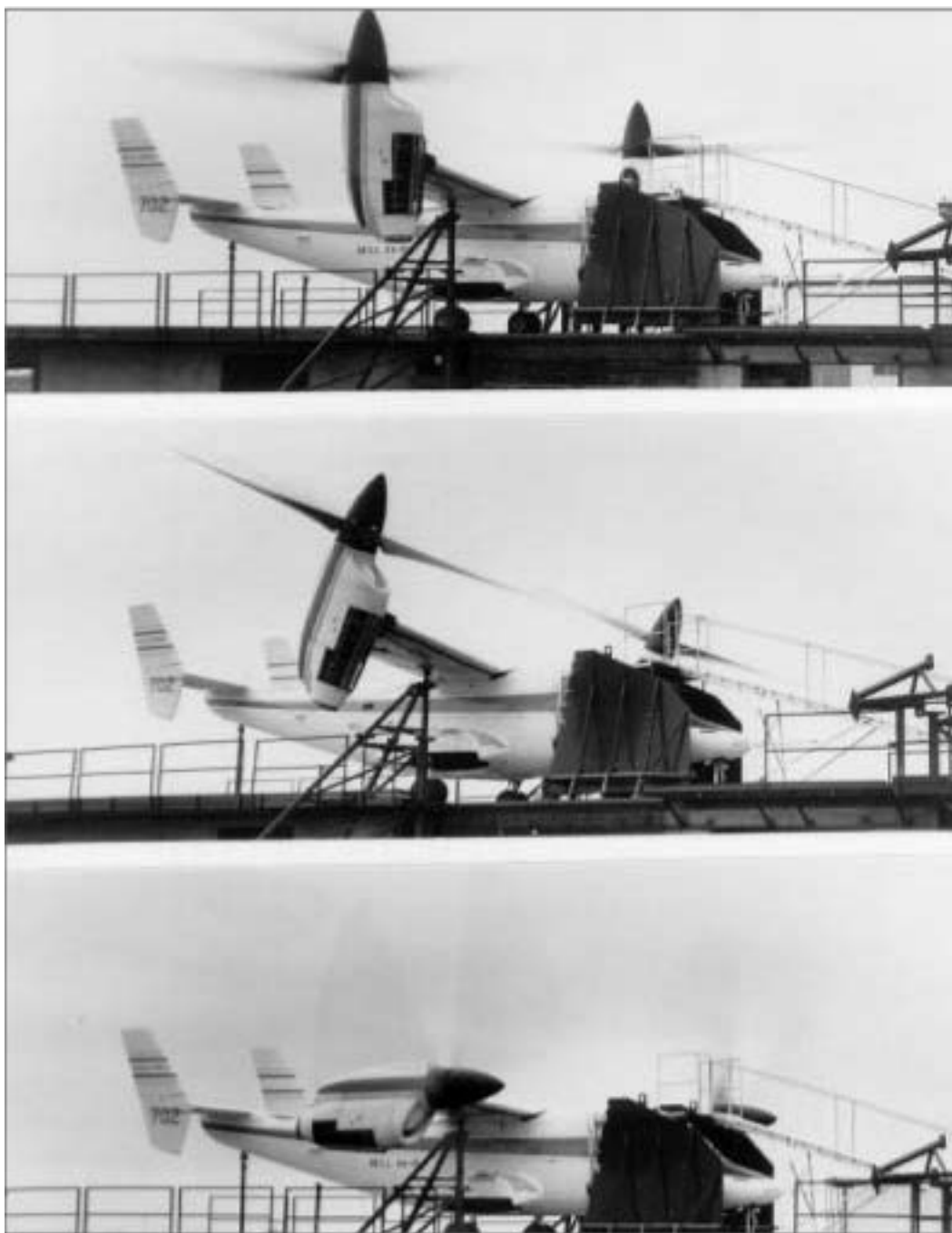


Figure 8. Initial Bell Tie Down Showing Metal Protective Shields

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Bell Photograph 240178, 54.



Figure 9. Top—Senator Goldwater in the XV-15 with Bell Pilot Dorman Cannon
Bottom—Secretary of the Navy John Lehman after Flying the XV-15

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Bell Photographs 02727 and 023970, 52.

V-22 Aircraft



Figure 10. The Bell Boeing V-22 Osprey in Hover Flight

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Ames Photograph AC89-0246-3, 107.

Civil Aircraft



Figure 11. Mockup of the BA-Model 609 Civil Tilt Rotor Aircraft with Bell Boeing Markings

Source: Martin D. Maisel, Demo J. Giulianetti, and Daniel C. Dugan, Monographs in Aerospace History #17, “The History of The XV-15 Tilt Rotor Research Aircraft From Concept to Flight” (National Aeronautics and Space Administration History Division, Washington, DC, 2000), Bell-Ames Photograph ACD97-0133-3, 109.

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